REMARKS

The Final Office Action mailed September 21, 2005 has been carefully reviewed and the foregoing amendment and following remarks have been made in consequence thereof.

Claims 1-4, 6, 7, and 9-12 are now pending in this application. Claims 1-4, 6, 7, and 9-12 stand rejected.

In accordance with 37 C.F.R. 1.136(a), a one month extension of time is submitted herewith to extend the due date of the response to the Office Action dated September 21, 2005 for the above-identified patent application to and including January 23, 2006 (January 21, 2006 was a Saturday). In accordance with 37 C.F.R. 1.17A(a)(1), authorization to charge a deposit account in the amount of $120.00 to cover this extension of time request also is submitted herewith.

The objection to Claims 7 and 9-12 is respectfully traversed. On page 2 of the Final Office Action, it is asserted that "[d]ictionary.com defines system as ' A group of interacting, interrelated, or interdependent elements forming a complex whole', thus rendering the statutory type ambiguous since a system could be a method and or apparatus." Applicants respectfully submit that claims directed to a "system" generally are not ambiguous, and are not directed towards a method. Indeed, many patents properly include claims directed to systems. Some of such claims directed to systems may include various components that are configured to perform one or more operations, for example a processor programmed to perform various operations. However, the inclusion of component(s) configured to perform various operation(s) in a claim directed to a system does not render the claim ambiguous as to whether the claim is directed to a method and/or an apparatus. In the present application, Claims 7 and 9-12, prior to entry of this Amendment, recite "a modeling system" comprising "a processor" configured to perform various operations. As such, Claims 7 and 9-12, prior to entry of this Amendment, are not directed to a method but rather are directed to a system having component(s) that are capable of performing various operations, and are therefore not ambiguous. However, to expedite prosecution of the present application, Claims 7 and 9-12 have been amended herein to be directed to an apparatus. Applicants believe that such amendment does not affect the scope of Claims 7 and 9-12. Accordingly, for at the least the reasons set forth above, Applicants request the objection to Claims 7 and 9-12 be withdrawn.

The rejection of Claims 1-4, 6-7, and 9-12 under 35 U.S.C. § 112, first paragraph is respectfully traversed.

It is asserted that "the stiffness multiplier is a mere 'listing' of what is associated with; one cannot solve a solution since the application is silent on the specifics of the empirical data is to be used or extracted" (Pages 6 and 7 of the Final Office Action) and "[t]he specification fails to detail how the regression equation, for example, is computed; there [is] little of no explanation of what the equation consist of nor what numerical values or limits the regression equation requires" (Page 2 of the Final Office Action). However, as is known, the patentee is not required to include in the specification information readily understood by practitioners, lest every patent be written as a comprehensive tutorial and treatise for the generalist, instead of a concise statement for persons in the field. The specification clearly describes that the stiffness multiplier is determined by testing several different bellows configurations and using the dynamic test data obtained therefrom in a regression equation. For example, the specification recites in part that:

> [s]hrouded bellows 12 is characterized using a standard geometry element that includes an assigned stiffness multiplier based on dynamic stiffness component test data. The stiffness multiplier is a finite element input that may be selectively adjusted to customize a dynamic stiffness of a particular shrouded bellows element. The stiffness multiplier is determined 120 with a regression equation that accounts for tube sub-system diameter 37 and 38, system operating pressure, bellows pitch 80, and dynamic system operating inputs. The regression equation is based on dynamic stiffness test data obtained as a result of testing several different shrouded bellows configurations. Each different shrouded bellows configuration can be analytically modeled to determine a unique stiffness multiplier for that specific shrouded bellows configuration and to generate a tube sub-system analytical model.

Specification, page 4, line 23-page 5, line 5. As such, the specification is not required to provide an arithmetic or equivalent software process for a particular solution to determining a stiffness multiplier because a particular solution is not claimed and such a process would be known to one skilled in the art based on Applicants' specification. Accordingly, Applicants submit that the specification contains a written description of the invention, and of the manner and process of making and using it, to enable any person skilled in the art to make and use the same.

On page 3 of the Final Office Action, it is asserted that the specification fails "to disclose what the 'interactive scheme' is or what the 'flexibility factors' are" and therefore "an individual reading the disclosure cannot arithmetically enable this process". However, as discussed above, the patentee is not required to include in the specification information readily understood by practitioners, lest every patent be written as a comprehensive tutorial and treatise for the generalist, instead of a concise statement for persons in the field. Moreover, the specification describes an exemplary analytical approach to determining flexibility factors, of which stiffness multiplier is one, wherein:

> a three inch diameter shrouded bellows centered on a twelve inch cantilevered straight tube section (not shown) within a system pressurized to approximately 100 psia in an approximately constant 2g vibratory environment, produced a natural frequency response of 166 Hz. The test component was modeled using finite element analysis to determine that assigning a flexibility factor of approximately 0.328, enabled the analytical model to yield the same natural frequency response as the component test piece under the approximate same operating conditions.

Specification, page 5, lines 18-25. Accordingly, Applicants submit that the specification contains a written description of the invention, and of the manner and process of making and using it, to enable any person skilled in the art to make and use the same.

On page 7 of the Final Office Action, it is asserted that "Applicants arguments is circular by stating the 'method can be practice on a computer such as a personal computer

or workstation'...then states 'The particular arithmetic or software solution is not claimed and the method includes steps that collect data from a dynamic stiffness test, which does not lend itself to an arithmetic or software process'...." Applicants disagree that such an argument is circular. Rather, the dynamic stiffness test used to obtain dynamic stiffness test data may not lend itself to an arithmetic or software process, while at least some steps recited in Claims 1-4, 6, 7, and 9-12 can be practiced using a computer. For example, Claim 7 recites a processor configured to, among other things, "determine a stiffness multiplier within the shrouded bellows components using a regression technique based on dynamic stiffness test data".

For at least the reasons set forth above, Applicants submit that Claims 1-4, 6-7, and 9-12 satisfy the requirements of Section 112, first paragraph. Applicants therefore request that the Section 112 rejection of Claims 1-4, 6, 7, and 9-12 be withdrawn.

The rejection of Claims 1-3, 6, 7, and 9-12 under 35 U.S.C. § 103(a) as being unpatentable over Technical Data Sheet "Pressure Fundamentals and Transmitter Selection" (Rosemount), in view of "Modeling Flexible Bellows by Standard Beam Finite Elements" (Broman) is respectfully traversed.

Rosemount describes the fundamentals of pressure measurement and also describes factors that should be considered when selecting a pressure transmitter for use inside a pressure transducer. Specifically, Rosemount describes an equation that is useful in identifying the natural frequency response of a flat diaphragm. While Rosemount does state that a bellows assembly may be used to "convert applied pressures into displacement", the bellows described in Rosemount are used in pressure measurement devices and do not include a fluid flow through the device. Rosemount describes considerations for selecting components of a static pressure measuring device but, does not describe a bellows designed to join two components in a fluid flow system. As such, the natural frequency responses of a pressure measurement device and flow through device would be different with respect to each other. For example, pressure fluctuation in a pressure measurement device is due to system fluctuations transmitted to the pressure measurement device through sensing lines. System flow does not flow through the pressure measurement device.

Broman describes a method of modeling flexible metal bellows by the existing beam element formulation of the computation software I-DEAS Master Series 6. While Rosemount describes a bellows useful to convert applied pressures into displacement, Broman describes a bellows in an exhaust system that is modeled based on system flow through the bellows assembly. Notably, Broman does not describe or suggest a method of modeling a shrouded bellows assembly. More specifically, Broman et al. describe modeling the bellows by beam elements. Further, Broman et al. describes determining axial stiffness by modeling the bellows as an equivalent pipe and a uniform rod, determining a bending stiffness of the bellows by modeling it as a beam with the bending stiffness expressed in terms of the axial stiffness, and determining a torsional stiffness of the bellows by modeling the bellows as a pipe.

Claim 1 recites a computer-implemented method for predicting natural frequency responses, wherein the method includes "providing at least one tube sub-system including a plurality of shrouded bellows components...determining a stiffness multiplier within each of the shrouded bellows components using a regression technique based on dynamic stiffness test data...inputting the determined stiffness multiplier into a computer model that applies a standard geometry element and a flexibility factor based upon the stiffness multiplier to predict a natural frequency response...and determining locations for duct supports based on the natural frequency response."

No combination of Rosemount and Broman describes or suggests the method recited in Claim 1. For example, neither Rosemount or Broman, considered alone or in combination, describe or suggest determining a stiffness multiplier within each of a plurality of shrouded bellows components using a regression technique based on dynamic stiffness test data. Rather, Broman describes modeling bellows using a beam element formulation of the computation software I-DEAS Master Series 6. Rosemount does not make up for the deficiencies of Broman, but rather describes an equation useful in identifying the natural frequency response of a flat diagram. Because Rosemount and Broman each individually fail to describe or suggest one or more elements of Claim 1, it follows that a combination of Rosemount and Broman cannot describe or suggest such element(s).

For at least the reasons set forth above, Claim 1 is submitted to be patentable over Rosemount in view of Broman.

Claims 2, 3, and 6 depend from Claim 1. When the recitations of Claims 2, 3, and 6 are considered in combination with the recitations of Claim 1, Applicants submit that dependent Claims 2, 3, and 6 likewise are patentable over Rosemount in view of Broman.

On page 8 of the Final Office Action, it is asserted that "the applicants state that the Broman (Modeling Flexible Bellows) reference does suggest a stiffness multiplier" and "Broman does teach a stiffness equation on page 17". Although Broman describes determining axial stiffness by modeling the bellows as an equivalent pipe and a uniform rod, determining a bending stiffness of the bellows by modeling it as a beam with the bending stiffness expressed in terms of the axial stiffness, and determining a torsional stiffness of the bellows by modeling the bellows as a pipe, Broman does not describe or suggest determining a stiffness multiplier using a regression technique based on dynamic stiffness test data.

Claim 7 recites an apparatus for determining natural frequency response of shrouded bellows components, wherein the apparatus includes a processor configured to "determine a stiffness multiplier within the shrouded bellows components using a regression technique based on dynamic stiffness test data...use the determined stiffness multiplier in a model that applies a standard geometry element and a flexibility factor based upon the stiffness multiplier to predict a natural frequency response of the bellows...and determine a location of a duct support based on the natural frequency response."

No combination of Rosemount and Broman describes or suggests the apparatus recited in Claim 7. For example, as described above neither Rosemount or Broman, considered alone or in combination, describe or suggest a processor configured to determine a stiffness multiplier within shrouded bellows components using a regression technique based on dynamic stiffness test data. Rather, Broman describes modeling bellows using a beam element formulation of the computation software I-DEAS Master Series 6. Rosemount does not make up for the deficiencies of Broman, but rather describes an equation useful in identifying the natural frequency response of a flat diagram. Because Rosemount and Broman each individually fail to describe or suggest one or more elements of Claim 7, it follows that a combination of Rosemount and Broman cannot describe or suggest such element(s).

For at least the reasons set forth above, Claim 7 is submitted to be patentable over Rosemount in view of Broman.

Claims 9-12 depend from Claim 7. When the recitations of Claims 9-12 are considered in combination with the recitations of Claim 7, Applicants submit that dependent Claims 9-12 likewise are patentable over Rosemount in view of Broman.

On page 8 of the Final Office Action, it is asserted that "the applicants state that the Broman (Modeling Flexible Bellows) reference does suggest a stiffness multiplier" and "Broman does teach a stiffness equation on page 17". Although Broman describes determining axial stiffness by modeling the bellows as an equivalent pipe and a uniform rod, determining a bending stiffness of the bellows by modeling it as a beam with the bending stiffness expressed in terms of the axial stiffness, and determining a torsional stiffness of the bellows by modeling the bellows as a pipe, Broman does not describe or suggest determining a stiffness multiplier using a regression technique based on dynamic stiffness test data.

Moreover, Applicants respectfully submit that the Section 103 rejection of Claims 1-3, 6, 7, and 9-12 is not a proper rejection. Obviousness cannot be established by merely suggesting that it would have been an obvious to one of ordinary skill in the art to modify Rosemount in view of Broman. More specifically, as is well established, obviousness cannot be established by combining the teachings of the cited art to produce the claimed invention, absent some teaching, suggestion, or incentive supporting the combination. As explained by the Federal Circuit, "to establish obviousness based on a combination of the elements disclosed in the prior art, there must be some motivation, suggestion or teaching of the desirability of making the specific combination that was made by the applicant." In re Kotzab, 54 USPQ2d 1308, 1316 (Fed. Cir. 2000). MPEP 2143.01.

Moreover, the Federal Circuit has determined that:

> [I]t is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the prior art so that the claimed invention is rendered obvious. This court has previously stated that "[o]ne cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention."

In re Fitch, 23 USPQ2d 1780, 1784 (Fed. Cir. 1992). Further, under Section 103, "it is impermissible . . . to pick and choose from any one reference only so much of it as will

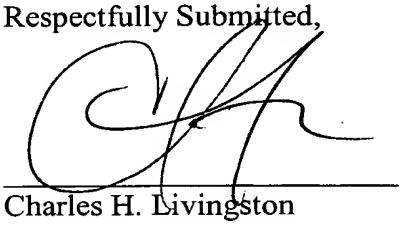
support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art." In re Wesslau, 147 USPQ 391, 393 (CCPA 1965). Rather, there must be some suggestion, outside of Applicants' disclosure, in the prior art to combine such references, and a reasonable expectation of success must be both found in the prior art, and not based on Applicants' disclosure. In re Vaeck, 20 U.S.P.Q.2d 1436 (Fed. Cir. 1991).

In contrast to the assertion within the Office Action, Applicants respectfully submit that it would not be obvious to one skilled in the art to combine Rosemount with Broman because there is no motivation to combine the references suggested in the art. For example, Rosemount does not describe a bellows that carries system flow but is rather, dead ended in the pressure measurement device, and, in contrast to Rosemount, Broman describes a bellows in an exhaust system that is modeled based on system flow through the bellows. Because there is no motivation in the cited art for the claimed combination, the Section 103 rejection appears to be based on a hindsight reconstruction in which isolated disclosures have been picked and chosen in an attempt to deprecate the present invention. Of course, such a combination is impermissible, and for this reason alone, Applicants request that the Section 103 rejection of Claims 1-3, 6, 7, and 9-12 be withdrawn.

For at least the reasons above, Applicants respectfully request the 103 rejection of Claims 1-3, 6, 7, and 9-12 be withdrawn.

In view of the foregoing amendments and remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

Respectfully Submitted,



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